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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,871	08/07/2001	Tatsuya Nishimura	2001-1110-A	9174
513 7590 11/08/2004 WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021			EXAMINER WILKINS III, HARRY D	
			ART UNIT 1742	PAPER NUMBER

DATE MAILED: 11/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/890,871

Applicant(s)

NISHIMURA ET AL.

Examiner

Harry D Wilkins, III

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 37-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 47-56 is/are allowed.
- 6) ☒ Claim(s) 37-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 090704.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7 September 2004 has been entered.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over So et al (JP 09-215982) in view of Spears (US 5,599,296) and Gilchrist (US 3,798,150).

So et al teach (see abstract and figure) an electrolytic device for electrolyzing water with reducing substances (sewage) at high temperature and pressure, the device containing a reaction cell defining a chamber with a pair of electrodes (1 and 2).

So et al do not teach maintaining the pressure of the influent so that the water of the influent is maintained in a liquid phase.

Spears teaches (see col. 8, lines 33-39) that the formation or growth of bubbles when a gas is dissolved in a liquid can be prevented by increasing the hydrostatic pressure on the liquid.

Therefore, it would have been obvious to one of ordinary skill in the art to have increased the hydrostatic pressure as taught by Spears on the water of the treatment of So et al such that any hydrogen and oxygen produced by the electrolysis reaction were dissolved into the water, thereby avoiding the formation of bubbles and avoiding any explosion hazards.

So et al do not teach that the device had two or more tubular reaction cells having a metal inner well serving as a cathode and an anode is provided in each of the reaction cells.

Gilchrist teaches (see Figs. 6-9 and col. 6, line 33 to col. 7, line 51) a reaction cell system that includes multiple tubular electrolytic cells (72 and 92) that have anodes disposed therein.

Therefore, it would have been obvious to one of ordinary skill in the art to have applied the method of So et al to the device of Gilchrist in order to make the treatment method of So et al continuous and to increase the amount of contact area of the waste water with the electrodes as provided for by the tubular electrode set up of Gilchrist (see Gilchrist at col. 2, lines 11-13).

4. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over So et al (JP 09-215982) in view of Spears (US 5,599,296) and Stralser (US 3,975,247).

So et al teach (see abstract and figure) an electrolytic device for electrolyzing water with reducing substances (sewage) at high temperature and pressure, the device containing a reaction cell defining a chamber with a pair of electrodes (1 and 2).

So et al do not teach maintaining the pressure of the influent so that the water of the influent is maintained in a liquid phase.

Spears teaches (see col. 8, lines 33-39) that the formation or growth of bubbles when a gas is dissolved in a liquid can be prevented by increasing the hydrostatic pressure on the liquid.

Therefore, it would have been obvious to one of ordinary skill in the art to have increased the hydrostatic pressure as taught by Spears on the water of the treatment of So et al such that any hydrogen and oxygen produced by the electrolysis reaction were dissolved into the water, thereby avoiding the formation of bubbles and avoiding any explosion hazards.

So et al do not teach that the device had two electrodes, each having two or more cylindrical walls as claimed.

Stralser teaches (see Figs. 4 and 5 and col. 6, line 53 to col. 7, line 9) such a device. The first electrode (comprising 26 and 28) had two concentric cylinder walls and the top of the cell connected the two walls to each other. The second electrode (comprising 27 and 29) had two concentric cylinder walls and the bottom of the cell connected the two walls to each other. The walls are arranged alternating with each other to form a channel for influent between the first electrode walls and the second electrode walls.

Therefore, it would have been obvious to one of ordinary skill in the art to have applied the method of So et al to the device of Stralser in order to make the treatment method of So et al continuous and to increase the amount of contact area of the waste water with the cathode and anode to provide higher current emission as provided for by the electrode set up of Stralser (see Stralser at col. 6, lines 53-57).

5. Claims 36 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over So et al (JP 09-215982) in view of Spears (US 5,599,296) and either Gilchrist (US 3,798,150) or Stralser (US 3,975,247) as applied to claims 35, 41, 47 and 52 above, and further in view of Yuasa et al (JP 09-117782).

The teachings of So et al in view of Spears and either Gilchrist or Stralser are described above in paragraphs no. 5 and 6. The apparatuses of Gilchrist and Stralser have influent lines and effluent lines for supplying and discharging the water from the reaction cell. It would have been within the expected skill of a routineer in the art to have provided the high hydrostatic pressure, as taught by Spears, through use of a high pressure pump.

However, So et al in view of Spears and either Gilchrist or Stralser do not teach that an oxidizer line is added for supplying an oxidizer to the reaction cell.

Yuasa et al teach (see English abstract) means for treating waste water under high pressure and temperature that includes adding an oxidizer, oxygen, to the reaction chamber for the purpose of facilitating the reaction for the eradication of the waste.

Therefore, it would have been obvious to one of ordinary skill to have added an oxidizer line to the apparatus of So et al in view of Spears and either Gilchrist or

Stralser because the oxidizer facilitates the removal of the waste from the water.

6. Claims 37 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over So et al (JP 09-215982) in view of Spears (US 5,599,296) and either Gilchrist (US 3,798,150) or Stralser (US 3,975,247) as applied above to claims 35, 41, 47 and 52 and further in view of Pitara et al (SU 962212).

The teachings of So et al in view of Spears and either Gilchrist or Stralser are described above in paragraphs no. 5 and 6.

So et al in view of Spears and either Gilchrist or Stralser do not teach that conductive particles were added to the influent.

Pitara et al teach (see Derwent abstract) that waste containing organic compounds was treated in a layer of granulated electrically conductive material that was located between two electrodes in a field.

Therefore, it would have been obvious to one of ordinary skill in the art to have adapted the method of So et al to include the addition of conductive particles as taught by Pitara et al because Pitara et al teach (see Derwent abstract) that the conductive particles provide a higher degree of purification of the waste water and a lower power consumption.

7. Claims 38-40 and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over So et al (JP 09-215982) in view of Spears (US 5,599,296), Pitara et al (SU 962212) and either Gilchrist (US 3,798,150) or Stralser (US 3,975,247) as applied to claims 37, 43, 49 and 54 above, and further in view of Hess et al (US 3,652,405).

As above, So et al in view of Spears, Pitara et al and either Gilchrist or Stralser do not expressly teach a separator being used to remove the conductive particles from the effluent stream.

However, because the goal of the process/apparatus of So et al is the purification of water, it would have been obvious to one of ordinary skill in the art to have added means for separating out the conductive particles because they would not be desired in the final pure water product.

A routineer in the art would have looked to conventional means for separating out the conductive particles, such as those disclosed by Hess et al (see figure and col. 2, lines 42-45) that a slurry (solid particles suspended in a liquid) was separated by means such as a filter or cyclone.

Hess et al teach that the separating means were either a filter or a cyclone. Thus, it would have been obvious to use one of the conventional means disclosed by Hess et al in order to separate out the conductive particles in order to have created a more pure final water effluent.

***Allowable Subject Matter***

8. Claims 47-51 and 52-56 are allowed.
9. The following is a statement of reasons for the indication of allowable subject matter: as discussed and shown in the document supplied during the interview on 21 July 2004, the present inventive method operates in a different manner than the prior art references relied upon in the previous rejection, i.e.-So et al (JP 09-215982), thus showing unexpected properties produced by the present invention. Thus, the method is



distinguished from the method of So et al. So et al describe a batch process, and in this instance it would not have been obvious to one of ordinary skill in the art to have adapted the high pressure apparatus to a continuous processing device because the means for keeping the pressure high (bolting the lid on) would not work for a continuous apparatus since the means for keeping the pressure high disallow continuous flow. In addition, the present claims are distinct from the claims of US 6,348,143, US 6,572,759 and US 6,585,882. As stated in the specification the present invention is an improvement over US 6,348,143 (the US equivalent of PCT/JP98/03544), in particular, even though the present invention appears to be making the process of '143 continuous, it would not have been within the expected skill of a routineer in the art to have adapted that process to be continuous due to various problems caused by the increased electrical requirement and limitations based on the electrode material as stated in the specification. Also, the claims of US 6,572,759 and US 6,585,882 do not teach the presently claimed improvements for creating a continuous process.

#### ***Response to Arguments***

10. Applicant's arguments filed 7 September 2004 have been fully considered but they are not persuasive. Applicant has argued that the presently claimed apparatus distinguishes over the prior art for reasons that the prior art does not teach the same manner of operation.

In response, the patentability of apparatus claims is not predicated on the manner of operation, only on the recited structure. In this instance, the prior art meets all the structural limitations of the presently claimed apparatus, even though it operates

in a different manner (as shown be the indication of allowability of the method claims).

See MPEP 2114.

### **Conclusion**

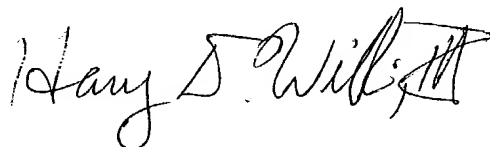
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-Th 10:00am-8:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Harry D Wilkins, III  
Examiner  
Art Unit 1742

hdw

A handwritten signature in black ink, appearing to read "Harry D. Wilkins, III", with a stylized flourish at the end.